TPRS

Quarterly Report

The official journal of the leading regional amateur radio digital communications organization of the Americas

AUGUST 2000

Published by the Texas Packet Radio Society · Volume 15, Issue 1

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President's Report

President's Report
Tom McDermott, N5EG

I have the sad news to report that Harry Ridenour, N0CCW, died last week, on August 9th. Harry was one of, if not the most active members of TPRS, and took it upon himself to manage the Texnet network. Harry was one of the crew from South Texas that found sites, talked with and cajoled people to donate tower sites, node locations, etc., and then backed up his talk with action. He spent many hours tracking the 'health' of the various nodes, reseting nodes when things got out of kilter, and helping the developers determine the right kind of features needed in the software to help keep the network running properly. It's impossible to even estimate how many hours he spent just monitoring the network. We are all going to miss Harry a lot. His good friend Paul Guido has some thoughts about Harry later on.

On a much happier note, Greg Jones, WD5IVD, erstwhile TPRS ex-President, and TAPR great got married recently in Austin, Texas. there was quite a crowd of

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TPRS
Quarterly Report

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hams at the event, and a wonderful time was had by all. The photographer, Bob Stricklin, N5BRG managed to get a couple of all-ham shots (smile for the camera, and say ‘oink’). We’ve allowed Greg some time for the honeymoon before he has to put the shots up on his web page!

With this issue, TPRS begins it’s 15th year. It’s hard to believe that it has been that long since we began producing the QR, and designing and developing packet hardware and software. Much has changed in that time, and packet radio is certainly not the same technical discipline as it was then. in 1985, most thoughts about packet radio dealt with infrastructure - how to build long-haul networks. In 2000 most thoughts are about applications - and there are several that no one ever thought of in the 1980’s. Today, much of the activity is on APRS and DX clusters. The Internet has provided linking of APRS and DX Clusters, and logging onto many different servers and clusters over the Internet is simple. Multimedia applications have yet to generally come about on packet radio, as they have yet to generally come about on the Internet. Perhaps in 5-10 years hence we will see both.

HAMCOM 2000

We had two booths at Hamcom this year - and had the chance to meet many of you that stopped by. Also, the packet presentations we again very well attended this year. The presentation room was overflowing during all 5 of the talks, and most of the time there were people out in the hallway trying to listen around the corner and through the door.

At the TPRS business meeting, Joe Borovetz, WA5VMS, and Dave Wolf, WO5H,

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both volunteered to run again as directors for a two year terms, and were re-elected.

Maury Guzeman did a great job as Hamcom Chair. This year was his first try, and everyone was pleased with how well he has picked up the activity, and the enthusiasm that he brings to the job.

Spread Spectrum Update

We received the updated RF and Digital boards forthe Spread Spectrum project. Whle the Rf boards are doing well, there's been a lot of problems with the digital board. Unfortunately at this point neither Bob nor I have been able to get the debugging port operational on the digital board. This means we can't make any progress. We will keep on the debugging phase here pretty intently until we can uncover the BDM problem. More later.

-30-

Harry Ridenour, N0CCW - Silent Key

by Paul Guido, N5IUT

My friends,

Over the past few months I have been working with Harry on some fun amateur radio projects all made easier do to restructuring. I helped him in June install a H.F. antenna and radio in his van for a trip scheduled in July. It was hard and hot work in his garage but the systems later use would make it all worth it.

During the work on his antenna in the hot thin humid air of his garage, Harry would joke, "It was a 'Bad AIR day'". I could tell that he was pushing it just sitting there directing my work. But, I also knew that he would not want to be any place else. He wished, as I, to see the job completed.

Before leaving for the trip I went to Fiesta Texas with Harry, Patty (Harry's wife), and two of Harry's grand children Sara and Caleb. It was a blast and a great time was had by all.

Harry, Patty and the grandkids left in early July to return the grandkids to there mom's and dad's in Montana. Two of Harry five daughters live in Montana. The hand off was made in Oregon. On the way there they stopped off at the Grand Canyon, Bolder Dam, Las Vegas, Reno, and finally Oregon. Harry felt good on the trip, getting out of "allergy central" San Antonio, for a while.

I had a number of QSO's with Harry mobile from my house. The first QSO was when he was driving from the Grand Canyon to Boulder City. The best QSO was from Southern Nevada to Phoenix, AZ. We QSO'ed three times on that day.

After returning to San Antonio on July 25th, Harry got hit hard with allergies again. He was in bed for three days.

Most of you know the fight that Harry has had with his lungs. The surgery that he had five years ago improved his quality of life. He was able to get out and do things that he had not done in years. But, with that surgery, comes a predictable curve. One of recovery from the surgery, improvement of function and then a slow decline.

After the allergies let up a little he noticed some back pain. The pain he believed was from the extended bed rest. But the pain was from his kidneys not his back. On Saturday August 5th Harry was admitted to the hospital. They doctors never did find out what was wrong with his kidneys. They ruled out stones and some other problems but we are still waiting to find out what happened.

About 8:45PM on Tuesday night I went to visit him. He told me how he day went. About how that are still trying to find out what was going on. He told me that in the morning that he was getting another kidney sonogram. He was hurting pretty bad but hanging in there.

Harry died at 7:30 AM on Wednesday August 9th

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2000. He was Born on May 7th 1933. He served his country in the army and retired as an E8 from the signal corp. He started out in the army running wire on the ground in the 50's, to using satellites
in the 60's, to fibre optic communications in the 70's.

A typical Harry side note: When the army doctors changed the color blind test in the late 60's from the book that he had memorized and discovered that he could not see red-orange, (it was all gray to him), they were blown away. They wanted to know how some one in signals could be color blind. He explained that he would use the colors that he could see on the frame and count up or down the wires he was testing.

Harry is survived by his wife Patty, five daughters, grand children, and great-grand children and his many friends.

Patty suggested that no flowers are sent. If you wish you can send a donation to the American Lung Association.

Wireless LAN resources for Linux

Jean Tourrilhes

This article is reprinted with the permission of the author. It is continued from part 2 in the May 2000 issue of the TPRS QR.

13 Security and Privacy

Because they use radio waves, wireless LANs are usually perceived as a security problem. For most users, the *network identifier* will be enough protection against casual users (other people can't accidentally join your network unless they guess the correct network identifier).

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Texas Packet Radio Society, Inc.

TPRS was founded in 1985 and is an educational, public service, and scientific research non-profit corporation. Texas Packet Radio Society goals are:

1- design and research amateur radio packet networks
2- provide education in the area of general packet usage

To accomplish better communications in the region, TPRS has been organizing statewide working groups to cover various networking topics. The current working groups are the Mailbox/BBS Group, TCP/IP Group, and the TexNet Support Group. TPRS hopes that these working groups will help promote information exchange in their respected areas in Texas. New working groups are formed as needed to provide channels for discussion and to help provide direction for that area of digital communications. Anyone can participate in a working group; TPRS membership is not required.

TexNet

TPRS has established a digital packet network protocol, a standard hardware package for the network nodes, and software modules that implement the TexNet network.

The basic design philosophy of TexNet is an open, inexpensive, multi-resource, high speed ‘backbone’ with access through multi-connect capable local nodes. On the high speed side, TexNet is a 9600 baud network system. For local access, compatibility with the typical 2 meter AX.25, 1200 baud, AFSK/FM station is the operational norm. Other baud rates and modulation techniques can be supported on the primary user port or secondary port. The system is totally compatible with both versions of the AX.25 protocol specifications for user connections. With these general specifications, TexNet has been designed and tested to enable all users to take advantage of this high speed, full protocol protected packet network system.

Each node offers, in addition to TexNet access, local area digipeater service, 2 conference bridges for full protocol protected roundtable or net operation, a full mult-connect, multi-user mailbox system, a local console for installation and maintenance setups, a debugger module for long distance and local software monitoring,and an interface for a weather information server for regional weather information, if available.

The NCP-PC (TexNet for PC) creates a direct interface to the PC platform. The Z80 based PC card supports 4 channels for communications. This co-processor approach allows the AX.25 and TexNet-IP to run on the card without affecting the PC. This allows the full power of the PC to be used for network applications. The versatility of this board is only now being developed and applications are endless.

The TexNet Network

The Texas TexNet network system has been operational since October 1986. When fully operational, the network reaches from the border of Mexico to Missouri. Use of the Texas TexNet system is open to all amateur operators. TPRS has been coordinating the installation of the Texas TexNet system. Further expansion of the system depends entirely upon the amateur community.

INFORMATION

TPRS is interested in spreading our information and research efforts as widely as possible. We want other groups involved with packet efforts to get in contact with us. We will provide information for those amateur packet groups that are interested in this system for their areas. If you would like more information concerning TPRS or TexNet, please drop a letter to:

Texas Packet Radio Society, Inc.
P. O. Box 50238
Denton, Texas 76206-0238

TPRS MEMBERSHIP

TPRS membership is widespread with most members located in Texas, but members are located in other states and in foreign countries. Membership is open to any interested person. If you are interested in becoming a member and receiving the TPRS Quaterly, please send your name, address and call with membership dues of $12 per year. A membership application is available elsewhere in this issue.

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Some people are more concerned about those issues or may want to increase the security of their system. Some Wireless LANs offer **MAC level encryption**, sometimes as an option, which is designed for those concerned users and target security equivalent to a having an Ethernet cable, and a few systems offer stronger encryption. This encryption is totally transparent to the higher layer and the user just need to set the same encryption key in the access point and all nodes of the network.

14 Benchmarks

For all the reasons described above, I think it is quite tricky to **benchmark** Wireless LANs, and measuring coverage or throughput in isolation is not fair. This is why I don't give any numbers. Some computer magazine publish from time to time some extensive review of all those products.

If you want to test the throughput of your device, you should use a tool called *Netperf*. You might want to submit your results in the database...

http://www.netperf.org/netperf/NetperfPage.html

Wireless Extensions for Linux

Jean Tourrilhes

23 January 97

A Wireless LAN API for the Linux operating system.

1 Introduction

The purpose of this document is to give an overview of the **Wireless Extensions**. The first part will explain the reason of this development and the generals ideas behind this work. Then, we will give the current status of the development. The third part will explore the user interface. We will finish by some implementation details and the possible evolution of the Wireless Extensions.

This document is a part of the Linux Wireless LAN Howto. Please refer to it for details.

2 Philosophy & Goal

It all started when I tried to install a **Wavelan** network on **Linux** computers. I was having a ISA and a PCMCIA versions of the Wavelan, and the two drivers were using totally different methods for the setup and collection of statistics (and in fact fairly incomplete...). As my small hard disks didn't allow me to reboot to DOS to set up those missing parameters, I started to modify the driver code.

I decided to define a wireless API which would allow the user to manipulate any wireless networking device in a **standard** and **uniform** way. Of course, those devices are fundamentally different, so the standardisation would only be on the methods but not on the values (a Network ID is always a parameter that you may set and get and use to distinguish logical networks, but some devices might use 4 bits and others 16 bits, and the effect of a change may be immediate or delayed after a reconfiguration of the device...).

This interface would need to be flexible and extensible. The primary need was for device **configuration**, but wireless **statistics** and the development of **wireless aware applications** was desirable. I needed also something simple to implement and conform to the Linux standard to have something much easier to share and maintain. The interface would need to evolve with the apparition of new products and with specific needs.

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I tried to be as generic as possible, but I was obliged to restrict myself on a specific set of devices. I focused on the **Wireless LAN** type of devices (indoor radio networks), which appears in the operating system as a normal network device. **AX25** (Amateur Radio) devices are too specific and have already their own specific network stack and tools. I also ruled out **cellular data** (data over GSM and mobile phone) and medium and long distance wireless communications because their interface are quite different and they don't operate in the same way. **InfraRed** should be similar enough to Radio LANs to benefit from this interface (if someday an InfraRed network driver for Linux appears).

As it was only an extension to the current Linux networking interface, I decided to call it ``Wireless Extensions''. The words interface and API are too ambitious for this simple set of tools.

3 Availability

The wireless extensions have been implemented in three complementary parts. The first part is the user interface, a set of tools to manipulate those extensions. The second part is a modification of the Linux kernel to support and define the extensions. The third part is the hardware interface and is implemented in each network driver itself to map the extensions to the actual hardware manipulations.

The kernel modifications have been included in the last Linux releases (from 2.0.30 and 2.1.17) and so the kernel now supports them. Users of release 1.2.13 may use a patch to add the support in their kernels. By default, the wireless extensions are disabled, and users need to enable the *CONFIG_NET_RADIO* option in the kernel configuration (this is the option which enables the choice of radio interfaces in the network driver list).

The tools are quite simple and so should be able to compile in any Linux system provided that the kernel supports wireless extensions.

The modifications of the wireless network drivers are probably the most important. Each driver needs to support wireless extensions and to perform the corresponding dialogue with the specific hardware. For now, only the Wavelan ISA and the Wavelan PCMCIA drivers support wireless extensions, but I'm confident that others will eventually follow. The modified Wavelan PCMCIA driver is available in the last pcmcia packages (from 2.9.1). The modified Wavelan ISA driver is available in the kernel (from 2.0.30 and 2.1.17).

4 User interface and tools

The user interface is composed of 3 programs and a /proc entry. The main goal of the Wireless Extension development effort wasn't the user interface, so this interface is quite basic.

4.1 /proc/net/wireless

This is a /proc entry. /proc is a pseudo file system giving information and statistics about the current system, which is usually located in /proc. These entries act as files, so a **cat** on them will give the required information. **/proc/net/wireless** is designed to give some wireless specific statistics on each wireless interface in the system. This entry is in fact a clone of /proc/net/dev which gives the standard driver statistics.

The output looks like this :

```
<jean@tourrilhes>cat /proc/net/
wireless
Inter-|sta|  Quality       |  Dis-
carded packets
 face |tus|link level noise| nwid
```

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```
crypt  misc
  eth2: f0   15.  24.    4.   181
0     0
```

For each device, the following information is given :

- *Status* : Its current state. This is a device dependent information.
- *Quality - link* : general quality of the reception.
- *Quality - level* : signal strength at the receiver.
- *Quality - noise* : silence level (no packet) at the receiver.
- *Discarded - nwid* : number of discarded packets due to invalid network id.
- *Discarded - crypt* : number of packet unable to decrypt.
- *Discarded - misc* : unused (for now).

These informations allow the user to have a better feedback about his system. A high value of *Discarded - nwid* packet might indicate a nwid configuration problem or an adjacent network. The *Quality - level* might help him to track shadow areas.

The basic difference between *Quality - link* and *Quality - level* is that the first indicate how good the reception is (for example the percentage of correctly received packets) and the second how strong the signal is. The *Quality - level* is some directly measurable data that is likely to have the same signification across devices.

When the *Quality* values have been updated since the last read of the entry, a dot will follow that value (typically, it mean that a new measure has been made).

4.2 iwconfig

This tool is designed to configure all the wireless specific parameters of the driver and the hardware. This is a clone of **ifconfig** used for standard device configuration. The following parameters are available :

- *freq* or *channel* : the frequency or the channel sequence.
- *nwid* : network id or domain, to distinguish different logical networks.
- the *name* of the ``protocol'' used on the air.
- *sens* : this is the signal level threshold to trigger packet reception (sensitivity).
- *enc* : the encryption or scrambling key used.

The frequency or channel parameter is the physical separation between networks (the keyword *freq* and *channel* are synonymous). For frequency hopping devices, it might be the hopping pattern. On the other hand, the nwid is only a logical (virtual) separation between networks which might be on the same frequency.

The name of the protocol is often the generic name of the device itself (for example ``*Wavelan''*). This is quite useful because these protocols are all incompatible. The apparition of standards such as **802.11** and **HiperLan** might help a bit in the future.

The encryption setting includes the key itself (up to 64 bits), the activation of encryption (*on*/*off*) and an optional argument (either the type of algorithm or the key number for multi key systems).

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Without any argument, **iwconfig** gives the value of these parameters (and the content of /proc/net/wireless) :

```
<jean@tourrilhes>iwconfig
lo        no wireless extensions.

eth1      no wireless extensions.

eth2      Wavelan  NWID:1234  Fre-
quency:2.422GHz  Sensitivity:4
          Link quality:15/15  Sig-
nal level:22/63  Noise level:0/63
          Rx invalid nwid:181  in-
valid crypt:0  invalid misc:0
```

By giving a command line option, the user may change these parameters (if it is possible in the driver and if the user is root). For example, to change the frequency to *2.462 GHz* and disable nwid checking on the device *eth2*, the user will do :

```
#iwconfig eth2 freq 2.462G nwid off
```

The user may also list the available frequencies for a specific device or the number of channels defined :

```
<jean@tourrilhes>iwconfig eth2
list_freq
10 channels ; available frequen-
cies : 2.422GHz  2.425GHz
2.4305GHz  2.432GHz  2.442GHz
2.452GHz  2.46GHz  2.462GHz
```

4.3 iwspy

iwspy was designed to test the **Mobile IP** support. It allows the user to set a list of network addresses in the driver. The driver will gather quality information for each of those addresses (updated each time it receives a packet from that address). The tool allows the user to display the information associated with each address in the list.

iwspy accept IP address as well as hardware addresses (MAC). IP addresses will be converted to hardware addresses before being transmitted to the driver. No verification is made on the hardware address. On the command line, hardware addresses should be prefixed by the keyword *hw* :

```
#iwspy eth2 15.144.104.4 hw
08:00:0E:21:3A:1F
```

The tool accept the keyword ``+" to add the new addresses at the end of the list :

```
#iwspy eth2 + hw 08:00:0E:2A:26:FA
```

To display the list of address :

```
<jean@tourrilhes>iwspy eth2
08:00:0E:21:D7:4E : Quality 15 ;
Signal 29 ; Noise 0 (updated)
08:00:0E:21:3A:1F : Quality 0 ;
Signal 0 ; Noise 0
08:00:0E:2A:26:FA : Quality 0 ;
Signal 0 ; Noise 0
```

The *(updated)* indication show that we have received a packet since we set the address in the driver. We haven't received anything from the second and third address (this explain why the values are 0). A **ping** to those address should solve the problem.

The number of addresses is limited to 8, because each address slow down the driver (it increases the processing for each received packets).

4.4 iwpriv

iwpriv is some experimental support for device specific extensions. Some drivers (like the Wavelan one) might define some extra parameters or functionality, **iwpriv** is used to manipulate those.

(Continued next issue.)

TPRS Node Assigments
Official Publication: February, 2000
Subject to Corrections/Additions/Deletions.

X = ACTIVE/COMPLETED
T = ACTIVE/TEST
P = PENDING

Nr	Status	City/Town	Alias	Call	User Port	Remarks
3	X	Dallas	TEXNET	WR5C	145.05	PMS
2	T	Richardson	TESTBED	W9DDD	None	R&D
	T	Richardson	RICH	W9DDD	None	R&D
1	X	Murphy	MURPHY	N5EG	145.09	
5	P	Austin	NWS	Unkn	None	Weather PMS
6	P	New Braunfels	STXWX	N5IUT	145.05	Weather PMS
7	X	Boerne	BOERNE	N5VUO	145.01	
8	X	Geronimo	GERONMO	WB5NSN	145.07	PMS(AKA GERLNK)
9	X	Austin	AUSTIN	WA5LHS	145.07	
11	X	San Antonio	ALAMO	N0CCW	145.09/223.50	
12	X	San Antonio	SALAMO	WA2MCT	None	
13	X	Denton	DENTON	W5NGU	145.03	
14	P	Lubbock	LUBBOCK	KC5KQF	145.05	
15	P	Midland	MIDLAND	WB5RXA	145.05	
16	X	Greenville	GREENVL	K5GVL	145.07	
17	P	Midland	MAFDXC	WF5E	223.58	DXCluster port
19	X	Rockport	ROCPRT	N5JKH	144.99/446.1	
20	X	C. Christi	CORPUS	N5XCH	145.05	
21	X	Pettus	PETTUS	KA5BWL	147.56	
23	P	Lubbock	LBBDXC	KA5EJX		DXCLUSTER
24	X	Austin	AUSDXC	K5TR	144.99	
25	X	Austin	ARESTC	W5TQ	145.73	
26	X	Victoria	VCTRIA	W5DSC	145.01	
27	X	Alice	ALICE	K5DYY	145.07	
28	P	Amarillo	AMARILO	WD5ILA	145.05	
29	P	Abilene	ABILENE	WB5EKW	145.05	
34	X	San Antonio	SANTEX	WB5FNZ	223.58	
42	X	Kingsville	TAMUK	W5ZD	144.91	(aka KINGVL)
43	P	Bryan/CollStn	SBRAZOS	KF5LN	145.05/446.10	
44	P	Bryan/CollStn	NBRAZOS	KG5ZD	446.1	(See Nr 43)
45	P	Fannin County	FANNIN	WB5RDD	145.05	
46	X	Sherman	SHERMAN	WB5CVR	144.91	
47	P	South Dallas	SDALLAS	KF5RN	None	
48	X	Waco	WACO	WD5KAL	145.09	
49	X	Falfurrias	FALFUR	WB5FRO	None	
50	X	Mercedes	VALLEY	W5RGV	144.60	DXCluster port 2
51	X	San Isidro	ISIDRO	K5RAV	None	
52	X	Brownsville	BROWX	K5RAV		NWS node
73	X	Fort Worth	FTWORTH	N5AUX	144.99	
80	T	AOHTST	AUSTIN	WB5AOH	None	R&D AUSTIN
95	T	TNC95	AUSTIN	WB5AOH	None	R&D AUSTIN

TPRS Node Assigments
Official Publication: February, 2000
Subject to Corrections/Additions/Deletions.
(Continued)

(100-150) Reserved for TexLink Node Usage

Nr	Status	City/Town	Alias	Call	User Port	Remarks
105	X	Floresville	FLORES	WD5DOE	None	
109	X	Refugio	REFUGIO	WB5OLT	None	
118		Moody	MOODY	W5ZDN	440.1	

(151-249) Reserved for Non-Texas Node Usage
(150-159) Reserved for Louisiana

151	X	Lafayette LA	LFTDXC	N5SYF	145.01	
152	P	BatonRouge LA	BTRDXC	N5VWM		
153	X	Maxie LA	MAXIE	K5USL	145.01	
160	X	Ft Gibson OK	FTGIBSN	N5GIT	145.01	
161	X	Muskogee OK	MKOTST	WA5VMS	446.5 PMS	
162	X	Muskogee OK	MUSKOGE	W5EJK	145.09	
164	X	Lincoln AR	FAYETVL	K5VR	145.69	
165	X	Clayton OK	CLAYTON	W5CUQ	145.03	
166	X	Ft Smith AR	FTSMITH	W5ANR	144.91	
168	X	Tulsa OK	NWTULSA	W5IAS	145.03	Temp. Off Air
169	X	Tulsa OK	TULWX	N5WX	NWS WX Server	
172	X	Okemah OK	OKEMAH	WB5HLR	145.69	
173	X	Choctaw OK	CHOCTAW	K5CAR	145.69	
174	?	Prarie Grove AR	HOGEYE	K5FXB	None	
175	X	Garfield AR	GARFLD	WB2ROC	None	
176	X	Aurora Missouri	OARSMO	K0SQS	145.05	
177	X	Mt Magazine AR	MAGAZIN	KF5XB	144.95	
178	X	Russelville	RSLVL	WB5BHS	UNKN	
179	X	Little Rock AR	LROCK	WB5SQK	144.97	PORT 2 446.50(FUTURE)
209	T	Little Rock AR	LRTST	KA5SQK	TEST Node	

(250-255) Network Reserved

If you are a TexNet node opearator/owner and have a correction to make to the list, advise to N0CCW@K3WGF.#STX.TX.USA.NOAM, or leave a message for N0CCW on the NDALLAS PMS of TexNet.

TPRS Membership Application

Name ______________________________ Callsign _______________
Address ____
Apt. or Mailstop ___________________
City/State ____
Zip _______________________ E-mail address ___________________
Evening Phone (   ) __________ Work Phone (   ) _____________

Membership is $12 per year. How many years are you paying for? ____

☐ New Member ☐ Renewal

Make check payable to: Texas Packet Radio Society

FOLD HERE

PLACE
STAMP
HERE

____
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____

ATTN:
Membership

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Denton, Texas 76206-0238

Texas Packet Radio Society, Inc.

Harry Ridenour, N0CCW, SK

Wireless LAN Resources for Linux - Part 3

Be sure to visit the TPRS web page:
http://www.tprs.org
for the latest information on TPRS activities.

A current listing of Packet nodes, frequencies, and networks is located in the **North American Digital Systems Directory (NADSD) on-line at:**
http://www.tapr.org/directory/index.html

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